

**STATE IMPLEMENTATION PLAN (SIP)
VOLUNTARY MOBILE EMISSION SOURCE PROGRAM (VMEP)
INTERIM ASSESSMENT**

2002 VMEP FINAL REPORT

**PREPARED FOR:
GEORGIA DEPARTMENT OF TRANSPORTATION**

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TABLE OF CONTENTS

GDOT RESEARCH AND MEASUREMENT TEAM	I
PROJECT TEAM.....	I
ADVISORY PANEL.....	I
TABLES	V
FIGURES.....	VI
EXECUTIVE SUMMARY	VII
INTRODUCTION	VII
ESTIMATING VMEP TRAVEL AND EMISSION REDUCTION TARGETS.....	VII
<i>November 2002 Regional Switcher Survey.....</i>	<i>viii</i>
<i>December 2002 Regional Transportation Survey.....</i>	<i>x</i>
<i>FY2002 Atlanta TDM Framework Evaluation.....</i>	<i>xi</i>
CONCLUSIONS AND RECOMMENDATIONS	XIII
SECTION 1 OVERVIEW.....	1
PURPOSE OF THE REPORT.....	1
ORGANIZATION OF THE REPORT	1
SECTION 2 NOVEMBER 2002 REGIONAL SWITCHER SURVEY.....	2
PURPOSE.....	2
METHODOLOGY	2
<i>Setting the SIP Target.....</i>	<i>2</i>
<i>Data Collection.....</i>	<i>2</i>
<i>Survey Instrument Overview.....</i>	<i>3</i>
FINDINGS.....	4
<i>Non-Switcher Qualifiers.....</i>	<i>4</i>
<i>Current Commute Mode.....</i>	<i>6</i>
<i>First Test for Non-Switchers.....</i>	<i>7</i>
<i>Second Test for Non-Switchers.....</i>	<i>7</i>
<i>CVT and PVT Switcher Tests.....</i>	<i>9</i>
TRAVEL AND EMISSION REDUCTIONS	9
<i>Method 1 – All Regional Commute Changes during 12-Year Evaluation Period.....</i>	<i>9</i>
<i>Method 2 – Regional Commute Changes during Abbreviated Evaluation Period.....</i>	<i>10</i>
<i>Method 3 – Higher to Lower Occupancy Adjustment.....</i>	<i>10</i>
<i>Method 4 – Direct Attribution to VMEPs and Higher to Lower Occupancy Adjustment.....</i>	<i>11</i>
SECTION 3 DECEMBER 2002 REGIONAL TRANSPORTATION SURVEY	13
PURPOSE.....	13
METHODOLOGY	13
FINDINGS.....	13
TRAVEL AND EMISSION REDUCTIONS	14
SECTION 4 FY2002 ATLANTA TDM FRAMEWORK EVALUATION.....	16
PURPOSE.....	16
METHODOLOGY	16
<i>October 2002 Regional Rideshare Placement Survey.....</i>	<i>16</i>
<i>October 2002 Employer Partner Employee Travel Survey.....</i>	<i>16</i>
<i>November 2002 Vanpool Rider Survey.....</i>	<i>17</i>
<i>February 2003 Discount Transit Pass User Survey.....</i>	<i>17</i>
TRAVEL AND EMISSION REDUCTIONS	17

SECTION 5 RECOMMENDATIONS AND CONCLUSIONS	19
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APPENDICES

APPENDIX A – NOVEMBER 2002 REGIONAL SWITCHER SURVEY SUMMARY REPORT	
APPENDIX B – DECEMBER 2002 REGIONAL TRANSPORTATION SURVEY SUMMARY REPORT	
APPENDIX C – NON-COMMUTE TRAVEL AND EMISSION REDUCTIONS	
APPENDIX D – FY2002 ATLANTA TDM FRAMEWORK EVALUATION SUMMARY REPORT	

TABLES

TABLE 1: DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES.....	X
TABLE 2: METRO ATLANTA RESIDENTS INCREASED USE OF ALTERNATIVE MODES FOR NON-COMMUTE TRAVEL.....	XI
TABLE 3: FY2002 DAILY TRAVEL AND EMISSION REDUCTIONS FOR NON-COMMUTE TRAVEL CHANGES	XI
TABLE 4: FY2002 ATLANTA TDM FRAMEWORK EVALUATION – TRAVEL AND EMISSION REDUCTIONS (COMMUTE RELATED).....	XII
TABLE 5: NON-QUALIFIED RESPONDENT COUNTS	4
TABLE 6: COUNTY OF RESIDENCE	5
TABLE 7: CURRENT EMPLOYMENT STATUS	5
TABLE 8: COMMUTE MODE SPLIT BY WEEKLY TRIPS	7
TABLE 9: FREQUENCY CHANGE RESPONDENTS.....	8
TABLE 10: METHOD 1 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES.....	10
TABLE 11: METHOD 2 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES.....	10
TABLE 12: METHOD 3 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES.....	11
TABLE 13: METHOD 4 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES.....	12
TABLE 14: METRO ATLANTA RESIDENTS USE OF ALTERNATIVE FORMS OF TRANSPORTATION FOR NON-COMMUTE TRAVEL	14
TABLE 15: METRO ATLANTA RESIDENTS INCREASED USE OF ALTERNATIVE MODES FOR NON-COMMUTE TRAVEL .	14
TABLE 16: SUMMARY OF FY2002 DAILY TRAVEL AND EMISSION REDUCTIONS FOR NON-COMMUTE CHANGES	15
TABLE 17: FY2002 ATLANTA TDM FRAMEWORK EVALUATION –TRAVEL AND EMISSION REDUCTIONS (COMMUTE RELATED).....	17

FIGURES

FIGURE 1: COMMUTE MODES USED BY WEEKLY FREQUENCY OF USE.....	6
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EXECUTIVE SUMMARY

INTRODUCTION

This report presents an interim assessment of the travel and emission reductions from commute and non-commute behavior changes that could be credited to Voluntary Mobile Source Emission Programs (VMEPs) in the Atlanta 13-county nonattainment area¹. VMEPs include transportation demand management (TDM) programs that encourage commuters and other travelers to voluntarily use alternative modes of transportation, an action that can help improve traffic congestion and air quality in a region. Atlanta's VMEP is a comprehensive TDM program that includes organizations such as The Clean Air Campaign, Transportation Management Associations (TMAs), and the Atlanta Regional Commission.

The interim assessment was conducted by the Center for Transportation and the Environment (CTE) on behalf of the Georgia Department of Transportation (GDOT) and the Georgia Department of Natural Resources, Environmental Protection Division (EPD). EPD estimated that 1.5% of the travel and emission reductions needed to bring the nonattainment area into compliance with federal air quality standards would come from VMEPs.² The VMEP estimate represents a daily reduction of 4.4 million vehicle miles, 4.28 tons of oxides of Nitrogen (NO_x), and 6.51 tons of Volatile Organic Compounds (VOC) to be achieved by 2004, the attainment or compliance year. The VMEP targets are presented by EPD in the State Implementation (SIP) for the Atlanta region.

This report presents the methods, data collection tools, and findings of the interim assessment. Conducted two years before the actual attainment year, the assessment provides an early indication of the region's likely ability to meet the SIP emissions reduction target. In addition, the assessment provides EPD an opportunity to evaluate the assumptions for how the region will meet the TDM VMEP target, as described in Appendix XXV of the SIP.

The assessment also serves as a test of the methods to assess vehicle miles traveled (VMT) and emission reductions from commute and non-commute behavior changes that could be credited to VMEPs. This report does not recommend a particular methodology, but instead presents suggestions for how the current methodologies could be improved in subsequent assessments.

ESTIMATING VMEP TRAVEL AND EMISSION REDUCTION TARGETS

In June 2001, EPD developed a scenario for how the region might meet the TDM VMEP target. Presented in Appendix XXV of the SIP, the scenario stated that 90% of the travel and emission reductions needed to meet the VMEP target would come from employees of Clean Air Campaign and TMA employer partners and the remaining 10% would come from commuters not affiliated with The Clean Air Campaign or TMAs ("collateral" activity).

Using the VMT target of a daily reduction of 4.4 million vehicle miles, a 30 mile average round trip length, and the 90/10 allocation between partner and "collateral" activity, EPD determined that 132,645 Clean Air Campaign and TMA commuters and 14,739 unaffiliated commuters would need to be placed in alternative forms of transportation, with each commuter reducing 10 vehicle trips per week, by the 2004 attainment date. EPD estimated these commuters would reduce 294,768 vehicle trips per day. As mentioned above, this represents a daily reduction of 4.4 million vehicle miles, 4.28 tons of NO_x, and 6.51 tons of VOC. In addition, EPD estimated The Clean Air Campaign and

¹ Thirteen (13) county nonattainment area includes Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale counties.

² USEPA allows up to three percent of the necessary emission reduction amount to be achieved through Voluntary Mobile Source Emission Reduction Programs (VMEP).

TMAAs would sign up 479 employer partners, with employees totaling approximately 338,000 by the 2004 attainment date.

EPD also stated in the SIP that they would conduct an annual evaluation to assess progress toward the TDM emission reduction target. The following section summarizes the various methods developed by the measurement team to assess attainment of the target. The measurement team used four impact measures to assess attainment: placements in alternative modes, vehicle trip reductions, VMT reductions, and ozone related emission reductions (NO_x and VOC).

November 2002 Regional Switcher Survey

The measurement team used the November 2002 Regional Switcher Survey to assess commute changes associated with VMEPs and unaffiliated or “collateral” commuters. This survey interviewed Atlanta area commuters to estimate the percentage who had made travel changes since 1990, the SIP baseline year. Using data from the survey, the measurement team developed four methods to calculate travel and emission reductions associated with these commute changes. The four methods differ in the nature, timing, and motivations for the changes.

Methods 1, 2, and 3 include commute changes associated with both VMEPs and “collateral” participation, a regional assessment of commute changes. Method 4 includes only changes associated directly with VMEPs. A brief summary of each method is presented below and the associated travel and emission reductions are presented in Table 1.

Method 1 – All Regional Commute Changes during 12-Year Evaluation Period - Method 1 credits reductions from commute changes that have occurred in the region anytime since the SIP baseline year (1990). This method does not consider the motivation for commute changes, nor does it consider if VMEPs influenced the changes.

Method 1 also counts only commute changes that reduce weekly vehicle trips, that is, changes from single occupant vehicles to alternative modes and changes from lower occupancy modes to higher occupancy modes (e.g., carpool to transit). It does not include respondents whose commute changes increased their weekly vehicle trips, such as would occur if a commuter switched from transit to carpooling. Nor does it include commuters who switched from alternative modes to driving alone, which would also result in increased weekly vehicle trips. As such, Method 1 does not reflect the full range of commute changes that occurred during this time period.

As shown in Table 1, Method 1 exceeds the VMEP commuter placement, VMT, and emission targets, but it does not meet the vehicle trip target.

Method 2 – Regional Commute Changes during Abbreviated Evaluation Period – Like Method 1, Method 2 does not consider the motivation for commute changes or account for the full range of commute changes. However, Method 2 does consider the time period from when commute changes took place. Method 2 credits reductions from commute changes that occurred during the time period when the region implemented VMEPs in earnest. It examines commute changes occurring over the past five years (Method 2-5Y) and commute changes occurring over the past two years (Method 2-2Y).

The 5-year evaluation period begins at the time when the region initiated many of the current local and regional commute services, such as the regional rideshare database and state and federal employer commute assistance programs. The 2-year evaluation period begins at the time the region initiated a large-scale media campaign and increased employer outreach to promote private sector employer commute assistance programs.

As shown in Table 1, the results for the 5-year evaluation period would meet the commuter placement, VMT, and NO_x targets but not the vehicle trip and VOC targets. Results for the 2-year period would meet the commuter placement target and nearly meet the NO_x target, but would fall substantially short of the vehicle trip, VMT, and VOC targets.

Method 3 – Higher to Lower Occupancy Adjustment - Method 3 partially addresses the issue of measuring the full range of commute changes by factoring in switches from higher to lower occupancy alternative modes, for example from transit to carpool. This method provides an indication of at least part of the potential negative impact of commute changes that increase weekly vehicle trips. Method 3 does not account for all negative impacts, because it does not include switches from alternative modes to driving alone. The method examines all three time periods described earlier: 12-year, 5-year, and 2-year.

Including in the estimated commuters who switched from higher to lower occupancy modes lowers the VMT and emission reduction estimates slightly. As shown in Table 1, the commuter placement targets are met for all time periods, but the vehicle trip targets are not. The VMT target is met for the 12-year period only and NO_x targets are met for the 12-year and 5-year periods. None of the results meet the VOC target.

Method 4 – Direct Attribution to VMEPs and Higher to Lower Occupancy Adjustment - Method 4 considers the motivation for commute changes, and specifically VMEPs that might influence commute behavior. Method 4 credits only influences from VMEP messages and services respondents can name or recall. As a result, it does not count the subconscious effect or the indirect impact of VMEPs that are not immediately evident or obvious to individuals making commute changes. It is likely that many commuters are prompted to make commute changes, but are not fully aware of the influences (either influences on them or on a rideshare partner) that led to the change. The results from Method 4 fall substantially short of all VMEP targets.

TABLE 1: DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES

Methods	Commuter Placements	Daily Vehicle Trips Reduced	Daily VMT Reduced (miles)	Daily NO_x Reduced (tons per day)	Daily VOC Reduced (tons per day)
VMEP SIP Targets	147,384	294,768	4,421,487	4.28	6.51
Method 1 – All Regional Commute Changes					
12-year evaluation period	308,550	258,318	5,088,867	6.00	6.95
Method 2 – Regional Commute Changes during abbreviated evaluation period					
5-year evaluation period (Method 2-5Y)	269,981	227,713	4,510,995	5.45	6.32
2-year evaluation period (Method 2-2Y)	205,186	176,341	3,539,159	4.25	4.92
Method 3 - Higher to Lower Occupancy Adjustment					
12-year evaluation period (Method 3-12Y)	308,550	227,721	4,486,099	5.29	6.13
5-year evaluation period (Method 3-5Y)	269,981	207,402	4,108,628	4.97	5.75
2-year evaluation period (Method 3-2Y)	205,186	159,525	3,201,663	3.85	4.46
Method 4 - Direct Attribution to VMEPs and Higher to Lower Occupancy Adjustment					
12-year evaluation period (Method 4-12Y)	60,939	42,027	907,355	1.04	1.21
5-year evaluation period (Method 4-5Y)	50,139	35,779	819,693	0.93	1.08
2-year evaluation period (Method 4-2Y)	37,026	28,502	633,031	0.71	0.82

Source: November 2002 Regional Switcher Survey

December 2002 Regional Transportation Survey

The measurement team used the December 2002 Regional Transportation Survey to assess travel and emission reductions for non-commute travel changes. Non-commute travel changes are not part of the current scenario proposed by EPD in Appendix XXV of the SIP. Typically, VMEPs focus on commuter related assistance programs; however, as part of employer and commuter outreach, VMEPs also promote the use of alternative modes for reducing non-commute trips. EPD wanted to investigate the potential impact these efforts may be having on non-commute travel changes and the impact these changes may have on the overall VMEP target assessment.

The regional transportation survey findings present a regional assessment of non-commute behavior during FY2002. Direct association between non-commute behavior and VMEPs is not considered in the interim analysis of the regional transportation survey. In addition, respondents who said they had reduced their number of non-commute trips by 10 or more trips were not included in the analysis to address measurement team concerns that respondents may have overestimated the number of non-commute mode changes made during the year. Lastly, the non-commute trip changes do not account for vehicle drivers who might have switched back and forth between modes over the course of the

year, and, as a result, the assessment may still overestimate non-commute travel changes to some degree.

At least one-in-ten metro Atlanta residents increased their use of alternative modes for weekly non-commute trips during FY2002. As shown in Table 2, residents who carpooled or vanpooled reduced 2.4 trips each week, while residents using non-motorized modes (bus, train, bicycling, or walking) reduced between two trips and 2.5 trips per week.

TABLE 2: METRO ATLANTA RESIDENTS INCREASED USE OF ALTERNATIVE MODES FOR NON-COMMUTE TRAVEL

Alternative Mode	Percent of Metro Atlanta Residents Increasing Use	Trips Reduced Per Week
Carpooling or vanpooling	10.3%	2.4
Bus or train	9.7%	2.0
Bicycling or walking	14.5%	2.5

Source: December 2002 Regional Transportation Survey

Using these findings and additional data provided by the Atlanta Regional Commission (ARC), the measurement team conducted an interim assessment of VMT and emissions reduced by non-commute travel changes. The results, presented in Table 3, indicate that, adding these reductions to the commute travel and emission reduction findings from the regional switcher survey would increase the likelihood of the nonattainment area meeting the VMEP target.

TABLE 3: FY2002 DAILY TRAVEL AND EMISSION REDUCTIONS FOR NON-COMMUTE TRAVEL CHANGES

Impact Measures	Non-Commute Travel			
	Carpool/ Vanpool	Transit/ Bus	Bike/ Walk	Totals
Percent of population increasing alternative mode use for non-commute travel	206,448	194,422	290,631	691,502
Daily non-commute trips reduced	52,796	41,434	77,422	171,652
Daily non-commute VMT reduced	480,799	256,615	154,457	891,871
NO _x emissions reduced (tons per day)	0.71	0.38	0.23	1.31
VOC emissions reduced (tons per day)	0.61	0.33	0.20	1.13

Source: December 2002 Regional Transportation Survey

FY2002 Atlanta TDM Framework Evaluation

GDOT is leading an effort to coordinate and maximize the effectiveness of transportation demand management (TDM) related Congestion Mitigation and Air Quality Improvement (CMAQ) funded projects and other federal, state, and privately funded projects in the 13-county nonattainment area. One component of this effort is an annual evaluation to measure travel and emission reductions for commuters who participate in TDM projects that receive CMAQ funds. The organizations participating in the evaluation are referred to as the Atlanta TDM Framework and include such organizations as The Clean Air Campaign, TMAs, and Atlanta Regional Commission's Commute Connections program. Other organizations and service providers participate in the Atlanta TDM Framework, including regional vanpool and transit providers.

While the annual evaluation is not conducted for the VMEP target assessment specifically, the measurement team has included it in this report as support data for the regional switcher survey commute travel and emission reduction findings. The fiscal year 2002 (FY2002) evaluation included commute related travel and emission reductions from a sample of Clean Air Campaign and TMA employer partners, as well as regional rideshare database participants, vanpool riders, and discount transit pass recipients. The travel and emission reductions include commuters who began using alternative modes or increased their frequency of alternative mode use during FY2002 and commuters who began using alternative modes prior to FY2002 and maintained use of the alternative modes during the year.

The Atlanta TDM Framework evaluation includes only the programs that can be validated with established data sources, and thus represents a conservative, lower bound estimate of commute related travel and emission reductions. In addition, the evaluation represents alternative mode use over a shorter time period than the VMEP target evaluation period in the SIP (1990 baseline, 12 year evaluation period).

For example, one of the Atlanta TDM Framework evaluation data collection activities was an employer partner employee travel survey of employees working for Clean Air Campaign and TMA employer partners. Conducted as a pilot evaluation in FY2002, the employees who participated in this survey represent only about 10% of the total employee population of Clean Air Campaign or TMA employer partners. The Atlanta TDM Framework plans to add more employer partners to the survey pool over the next several years, thereby increasing the number of employees represented by the survey findings and providing a more accurate estimate of the level of commute related travel and emission reductions achieved by Clean Air Campaign and TMA employer partners.

As shown in Table 4, the VMT, NO_x, and VOC reductions for the annual Atlanta TDM Framework evaluation fall between Method 4-5Y and Method 4-2Y projections for the regional switcher survey. As mentioned previously, both the Atlanta TDM Framework evaluation and the Method 4 regional switcher survey evaluation represent conservative, lower bound estimates of travel and emission reductions associated with VMEPs. The fact that the travel and emission reductions for these two methods are similar validates these conservative approaches.

TABLE 4: FY2002 ATLANTA TDM FRAMEWORK EVALUATION – TRAVEL AND EMISSION REDUCTIONS (COMMUTE RELATED)

Impact Measure	Atlanta TDM Framework
Commuter placements	53,442
Daily vehicle trips reduced	37,507
Daily VMT reduced	779,924
Daily NO _x emissions reduced (tons per day)	0.77
Daily VOC emissions reduced (tons per day)	0.89

Source: FY2002 Atlanta TDM Framework Evaluation

The Atlanta TDM Framework evaluation also tracks the number of Clean Air Campaign and TMA employer partners and approximate number of employees working at these worksites. As of November 2002, The Clean Air Campaign and TMAs had signed up more than 600 employer partners, totaling to more than 600,000 employees. These findings greatly exceed the EPD estimate in Appendix XXV of the SIP (479 employer partners, totaling 338,000 employees, by 2004).

CONCLUSIONS AND RECOMMENDATIONS

The interim VMEP target assessment identifies a difference between measured data and the TDM attainment scenario described in Appendix XXV of the SIP. The number of commuter placements identified in the regional switcher survey revealed that EPD underestimated the overall number of commuter related placements and overestimated the number of daily vehicle trips reduced as a result of these commuter placements.

The TDM scenario proposed by EPD also overestimates the number of VMEP associated commuter placements. A comparison of the commuter placement estimates for Method 3 and Method 4 reveal that VMEP related commuter placements currently make up about 20% of regional placements, with “collateral” participation making up the remaining 80% of regional placements. The EPD scenario estimated approximately 90% of the commuter placements would come from VMEPs. It is likely a higher percentage of commuter placements are associated with VMEPs than identified in the regional switcher survey, but, due to the difficulty in identifying why people make commute changes, VMEP related participation or commuter placements cannot be measured accurately. The potential undercounting of VMEP related placements is supported by the over 600 employer partners, totaling to more than 600,000 employees, currently affiliated with The Clean Air Campaign or TMAs. This estimate greatly exceeds the EPD SIP estimate of 479 employer partners, totaling to 338,000 employees by the 2004 attainment date.

As stated previously, many commuters are prompted to make commute changes, but are not fully aware of VMEP influences on them or on their rideshare partners. Therefore, any attempts to determine the VMEP and collateral participation influence will always show a higher percentage of collateral participation, some of which has been influenced indirectly by VMEPs. These findings support the focus that EPD has on the total emission reductions to be achieved and not on the distinction between VMEP and collateral participation or commute changes, since it may be impossible to accurately determine the influences VMEP related messages and services have on commuters.

In addition, the current scenario does not include potential impacts from non-commute travel changes. The non-commute assessment indicates metro Atlanta residents made significant changes in non-commute travel during FY2002, with reductions close to 20% of the current travel and emission targets. As such, EPD should also consider adding travel and emission reductions for non-commute behavior changes to the TDM emission reduction target.

These findings suggest several recommendations EPD should consider when refining the methods and data collection tools for future VMEP target assessments. The recommendations, if implemented, will allow EPD to assess both VMEP and collateral participation, or both regional commute changes and commute changes directly associated with VMEPs. The recommendations include:

- **Collect data on “drive alone switchers”.** The recommendation involves expanding the regional switcher survey to capture all types of commute changes, including commuters who switch from an alternative mode to drive alone. EPD could then include the full range of commute change impacts in the overall regional behavior change assessment.
- **Refine commute methodology questions related to VMEP influence.** The recommendation involves refining the regional switcher survey to include more detailed questions about why commuters made commute changes and the potential influence of VMEPs on the commute changes in order to examine causality more thoroughly. Examining influence more thoroughly may help address, to some degree, the possible undercounting of commute changes influenced by VMEPs. However, VMEP related commuter placements measured via a regional transportation survey are likely always to represent a conservative, lower bound

estimate of VMEP related travel and emission reductions, due to the difficulty in identifying why people make commute changes.

- **Refine the non-commute methodology to ask more detailed questions about non-commute travel changes and questions about influence of VMEPs.** This recommendation involves adding a question to the regional transportation survey about the number of weekly non-commute trips, on average, made by each respondent. This question will address the concern that respondents may have overestimated the number of weekly trips reduced by non-commute mode changes that they reported in the December 2002 survey and help frame the number of non-commute trips, on average, actually made by respondents. Adding an additional question on the longevity of the travel pattern change will help address the concern about residents switching back and forth between modes during the year.

In addition, the measurement team recommends adding questions to the non-commute series of questions about the potential VMEP influence for an evaluation of non-commute changes directly associated with VMEPs.

- **Continue to enhance the annual Atlanta TDM Framework Evaluation, using it to support the findings of the commute behavior change assessment.** The measurement team recommends that the Atlanta TDM Framework continue to conduct and enhance annual evaluations of their programs so that EPD can use these findings to support the overall VMEP target assessment. In particular, the Atlanta TDM Framework should continue to increase the number of employer partners participating in employee level travel surveys in order to provide a more accurate estimate of the level of travel and emission reductions achieved by Clean Air Campaign and TMA employer partners.

SECTION 1 OVERVIEW

PURPOSE OF THE REPORT

In fiscal year 2001 the measurement team began developing a methodology to assess the 13-county Atlanta nonattainment region's fulfillment of the 2004 travel and emission reduction goals established in the State Implementation Plan (SIP) for Voluntary Mobile Source Emission Reduction Programs (VMEP). The methodology was developed on behalf of the Georgia Department of Transportation (GDOT) and the Georgia Department of Natural Resources, Environmental Protection Division (EPD).

The U.S. Environmental Protection Agency (USEPA) allows states or metropolitan areas to project in a SIP that up to 3% of the necessary travel and emission reductions will be achieved through VMEPs. VMEPs include transportation demand management (TDM) programs that encourage commuters and other travelers voluntarily to use alternative modes of transportation for their travel, an action that can help reduce traffic congestion and improve air quality in a region. Atlanta's VMEP is a comprehensive TDM program that includes organizations such as The Clean Air Campaign, Transportation Management Associations (TMAs), and the Atlanta Regional Commission.

EPD has estimated that 1.5% of the travel and emission reductions needed in the SIP for the Atlanta region for 2004, the attainment year, would come from voluntary programs. This reduction represents a daily reduction of 4.28 tons of NO_x and 6.51 tons of VOC, to be achieved by reducing 4.4 million miles of travel.

In 2002, the measurement team implemented several methods and data collection tools to assess attainment of the VMEP target. This report presents these methods and data collection tools and provides an interim assessment of VMEP attainment. The measurement team used four impact measures to assess attainment: commuter placements in alternative modes, vehicle trip reductions, VMT reductions, and ozone related emission reductions (NO_x and VOC). Lastly, the report presents suggestions for how the current methods and data collection tools could be improved for future assessments.

ORGANIZATION OF THE REPORT

The report is divided into five sections.

- Section 1 – Purpose and organization of the report
- Section 2 – Description and findings of November 2002 Regional Switcher Survey
- Section 3 – Description and findings of December 2002 Regional Transportation Survey
- Section 4 – Description and findings of FY2002 Atlanta TDM Framework Evaluation
- Section 5 – Conclusions and recommendations

The report also includes the following appendices:

- Appendix A – November 2002 Regional Switcher Survey Summary Report
- Appendix B – December 2002 Regional Transportation Survey Summary Report
- Appendix C – Non-Commute Travel and Emission Reductions
- Appendix D – FY2002 Atlanta TDM Framework Evaluation Summary Report

SECTION 2

NOVEMBER 2002 REGIONAL SWITCHER SURVEY

PURPOSE

The purpose of the regional switcher survey was to determine the percentage of commuters in the 13-county Atlanta nonattainment area who had made a commute change to an alternative mode that reduced their number of weekly commute trips. The measurement team asked a sample of these commuters, referred to as switchers, more detailed questions about these changes in order to estimate resultant travel and emission reductions and assess attainment of the VMEP target. The survey focused on commuters who had reduced their number of weekly trips to align with the scenario described by EPD in Appendix XXV of the SIP. The scenario in Appendix XXV included commuters who had made commute changes that resulted in a reduction of 10 trips per week for each commuter since the VMEP assessment baseline year of 1990 (12 year evaluation period).

A copy of the full November 2002 Regional Switcher Survey Report can be found in Appendix A. The report includes a detailed description of the data collection methodology, survey findings, and travel and emission reductions. A summary of the report is presented below.

METHODOLOGY

Setting the SIP Target

In June 2001, EPD presented one of several possible scenarios for how the region might meet the VMEP target. The scenario, presented in Appendix XXV of the SIP, assumes 90% of the travel and emission reductions needed to meet the VMEP target would come from employees of Clean Air Campaign and TMA employer partners. EPD assumed the remaining 10% of travel and emission reductions needed to meet the VMEP target would come from commuters not affiliated with The Clean Air Campaign or the TMAs, referred to as “collateral” reductions.

Using the VMT target of a daily reduction of 4.4 million vehicle miles, a 30 mile average round trip length, and the 90/10 allocation between partner and “collateral” impacts, EPD determined that 132,645 Clean Air Campaign and TMA commuters and 14,739 unaffiliated commuters would need to be placed in alternative forms of transportation, with each commuter reducing 10 vehicle trips per week, by the 2004 attainment date. EPD estimated that the number of commuters placed in alternative modes would reduce 294,768 vehicle trips per day. The reduction in vehicle trips represents a daily reduction of 4.4 million vehicle miles, 4.28 tons of NO_x, and 6.51 tons of VOC. In addition, EPD estimated The Clean Air Campaign and TMAs would sign up 479 employer partners, with employees totaling approximately 338,000 by the 2004 attainment date.

Data Collection

The measurement team, in consultation with EPD, decided to conduct a regional transportation survey to provide an interim assessment of the VMEP target. A regional survey, conducted via the telephone, provided the best opportunity to assess both VMEP and “collateral” participation and the extent of commute changes occurring among these populations. For ease of terminology, the respondents making commute changes were referred to as “switchers” and the regional survey was termed the “switcher survey.”

The measurement team decided a minimum sample size of 400 switchers, survey respondents making a commute change that reduced their number of weekly commute trips, would provide a reasonable level of statistical accuracy to estimate the travel and emission reductions for regional commute changes. The confidence level for the 400 switchers is +/- 4.9% in 95 out of 100 cases (95% confidence level).

These switchers were identified from a sample of regional commuters, selected through random telephone calls. To qualify for the sample, a survey respondent had to meet three basic qualifiers:

- County of residence within 13 specified counties
- Age 18 or older
- Current employment status either full-time or part-time outside the home

Obtaining a representative sample at the county level was not an objective of the survey. As a result, the survey findings cannot be examined on a county-by-county basis; they can only be generalized to the region as a whole. The measurement team attempted a total of 3,509 interviews to obtain 400 completed switcher interviews.

Survey Instrument Overview

The regional switcher survey is divided into seven sections. The first six sections screened for qualified commuters who are switchers (commuters who made a commute change that decreased their number of weekly trips). The last section collected travel pattern change information and data on other variables for switchers. The sections and their functions are briefly explained below.

- 1 – First Non-Switcher Screeners** (asked of all respondents) – Screens for “qualified” commuters and defines years in Atlanta. Defines current commute modes/frequency and creates “current travel grid.” Establishes carpool/vanpool occupancy. Screens out respondents who drive alone full-time.
- 2 – Mode Switch Screeners** (asked of respondents who use an alternative mode, including compressed work schedules and telecommuting, during a “typical week”) – Identifies respondents who switched to a new alternative mode since 1990, the baseline year for the VMEP target, or since they entered the Atlanta workforce, defines previous modes used, and establishes mode frequency for a previous “typical week” (previous travel grid).
- 3 – Frequency Switch Screeners** (asked of respondents who use an alternative mode but did not make a mode change) – Identifies respondents who increased the frequency of alternative mode use and establishes the mode frequency for a previous “typical week” (previous travel grid).
- 4 – Occupancy Switch Screeners** (asked of carpoolers who did not make a mode change or frequency change) – Identifies respondents who increased the occupancy of their carpool and identifies the previous occupancy of the carpool.
- 5 – Past Travel Grid** (established for all alternative mode users) – Establishes modes and frequencies of past mode use for all alternative mode respondents. Sets past mode use to be equal to current mode use for current alternative mode users who made only an occupancy change.
- 6 – Switcher Tests** (all alternative mode users) – Calculates current weekly vehicle trips (CVT) and past weekly vehicle trips (PVT). Compares PVT to CVT to determine if vehicle trips have been reduced from past to current travel. If CVT is less than PVT, trips have been reduced and the respondent is a switcher.
- 7 – Switcher Questions** (asked of respondents who qualify as switchers) – Asks additional travel pattern, influence, and demographic questions.

The measurement team identified the three switch types—mode switches, frequency switches, and occupancy switches—in a hierarchical manner for interview efficiency. If a respondent had made a qualified mode switch, questions to test for frequency and occupancy switches were not needed to know that the respondent was a switcher. If the respondent did not make a mode switch, the interviewer asked the respondent if he/she made a frequency change. If the respondent did not make

a frequency switch, the interviewer asked the respondent if he/she made an occupancy change. Switches were addressed in this order on the assumption that mode switches would constitute the largest volume of switches, with frequency second and occupancy third.

FINDINGS

As mentioned above, survey interviewers attempted a total of 3,509 interviews to obtain 400 completed switcher interviews. The following sections show the survey responses as respondents progressed through the interview. As noted, the number of respondents being asked questions decreases from section to section as a result of non-qualified respondent exclusions (e.g., early terminates, outside survey area, and under 18 years old), additional self-terminates, and survey respondents who refused to answer certain questions.

Non-Switcher Qualifiers

About one-quarter (25.7%) of the interviews were initiated with respondents who were not qualified to participate in the survey because they failed to meet one of the qualifying screeners noted above. The numbers of respondents in each of these categories are shown in Table 5.

TABLE 5: NON-QUALIFIED RESPONDENT COUNTS

Non-Qualified Categories	Frequency	Percent
Early terminates*	191	5.4%
Outside survey area	89	2.5%
Under 18 years old	36	1.0%
No workers in household	586	16.7%
Total non-qualified respondents	902	25.7%
Qualified respondents	2,607	74.3%
Total	3,509	100.0%

Source: November 2002 Regional Switcher Survey

*Note: Early terminates include respondents who refused to answer qualifying screener questions.

Home Location - The distribution of respondents by county of residence is shown in Table 6. The percentages of respondents for each county roughly mirror the proportion of the population of the counties as they relate to the overall 13-county region. Due to the small samples in some counties, the survey results cannot be examined on a county level; they can only be generalized to the region as a whole.

TABLE 6: COUNTY OF RESIDENCE
(n=3,193)*

County	Frequency	Percent
Cherokee County	158	4.9
Clayton County	240	7.5
Cobb County	96	3.0
Coweta County	93	2.9
DeKalb County	629	19.7
Douglas County	77	2.4
Fayette County	89	2.8
Forsyth County	128	4.0
Fulton County	815	25.5
Gwinnett County	602	18.9
Henry County	131	4.1
Paulding County	65	2.0
Rockdale County	70	2.2
Total	3,193	100.0

Source: November 2002 Regional Switcher Survey

*Note: n=3,193 excludes early terminates and out-of-area and underage respondents

Current Employment Status – As shown in Table 7, about 88.1% of the survey respondents said someone in their household was currently employed.

TABLE 7: CURRENT EMPLOYMENT STATUS
(n=2,564)*

Employment Status	Percent
Yes, part-time	12.6%
Yes, full-time	75.5%
Homemaker	1.7%
Self-employed	6.5%
No, not employed	3.7%

Source: November 2002 Regional Switcher Survey

*Note: n=2,564 excludes non-qualified respondents, additional terminates, and refusals

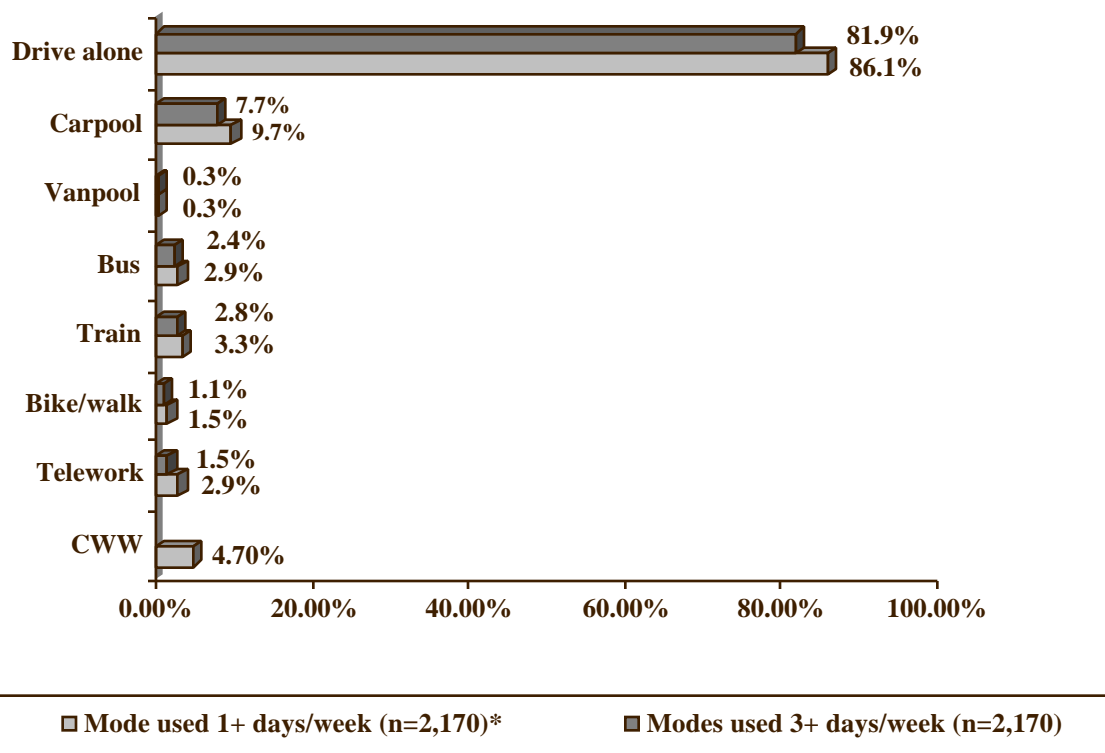
Respondents in the last three categories (homemaker, self-employed, not employed) were not qualified to participate in the survey. The interviewers asked these respondents for a referral to another member of the household who was employed either full-time or part-time. If the respondent provided the referral, the interviewer restarted the interview with the new, qualified respondent.

Current Commute Mode

Figure 1 shows percentages of respondent and how they traveled to and from work based on frequency of mode use. The top bar of each mode group shows the percentage of respondents who used a mode as their “primary” or “regular” mode, that is they used the mode three or more times per week to commute to and from work. As shown, the most common primary mode was drive alone, used by 81.9% of respondents. The second most popular mode, used by 7.7% of respondents, was carpool.

The bottom bar of each mode group shows the percentage of respondents who use a mode at least one day to travel to and from work during the week. This category also includes respondents who said they used these modes two, three, four, five, or more times during the week. In this case, the percentages of participants using each mode increased, because some respondents who were counted in the three or more days per week category used a secondary mode in addition to their primary mode. Drive alone and carpool were still the most popular modes, with 86.1% of respondents driving alone and 9.7% carpooling either a regularly or occasionally.

FIGURE 1: COMMUTE MODES USED BY WEEKLY FREQUENCY OF USE



Source: November 2002 Regional Switcher Survey

*Note: Total will add to more than 100%; multiple responses permitted.

Table 8 summarizes the current mode split as the percentage of weekly trips made for all, with telework and compressed schedules included as “modes.” Similar to the frequency of mode use presented in Figure 1, the largest percentage (82.3%) of weekly trips are made by driving alone.

TABLE 8: COMMUTE MODE SPLIT BY WEEKLY TRIPS

Commute Mode	Mode as % of Weekly trips (n=2,170)
Drive alone	82.3%
Carpool	7.9%
Vanpool	0.3%
Bus	2.5%
Train	2.8%
Bike/walk	1.3%
Telework*	1.7%
Compressed Work Week*	1.1%

Source: November 2002 Regional Switcher Survey

*Assumed to be 0.5 weekly trips per respondent for commuters who occasionally telework and for commuters who work a 9/80 compressed work week schedule

First Test for Non-Switchers

The measurement team used the current commute mode question to derive the “current travel grid” that showed, for each respondent, the modes used by each day of the week. The interviewer used the grid to define a large group of respondents who could be positively identified as non-switchers, because they drove alone each commute day. A switcher had to be using an alternative mode at least one day per week (or one day every other week for 9/80 compressed schedules) or teleworking occasionally (1-3 times per month on a regular basis).

The results showed that 1,504 respondents, or about 66% of the 2,289 qualified respondents making it to this point of the survey, could be eliminated at this first test for non-switching. These respondents were thanked for participating in the survey and their interviews terminated. Interviewers asked the remaining 785 respondents whose current travel grid showed at least one alternative mode about the type of switches they might have made.

Second Test for Non-Switchers

The next step in the screening was to determine if respondents had made a mode switch, frequency switch, or occupancy change during the 12-year evaluation period. As mentioned previously, mode switches were examined first, because it was expected that they would constitute the largest percentage of switches.

Mode Switch Screening - Since not all respondents had been working in the Atlanta area since 1990, it was necessary first to determine the length of time respondents had used each current alternative mode mentioned in the current travel grid. As with the duration of working in Atlanta, several prompts were included, if necessary, to assist respondents to identify the approximate time of the switch. If the respondent had used more than one alternative mode, the questions about duration were repeated for each alternative mode.

For each respondent, the duration of mode use was compared against 144 months, the number of months elapsed since 1990, or the number of months the respondent had been working in the Atlanta region. If this comparison showed that the start date for the alternative mode was less than 144 months or less than the time working in Atlanta, this respondent was considered a mode switcher. Interviewers asked these respondents follow-up questions to determine the modes used prior to this change and the weekly frequency of use of each mode. About three in five (456 respondents, 58%) of the 785 alternative mode users said their change occurred within the evaluation period.

Interviewers asked respondents who said they made a mode switch what modes they had used before making the switch and how many days in a typical week they used the modes. These results were used to calculate the previous weekly vehicle trips for each respondent.

Frequency Switch Screening - If the comparison of alternative mode duration to the evaluation period showed that the time using the alternative was greater than or equal to 144 months or equal to the time the respondent had worked in Atlanta, the respondent had not made a mode switch. The interviewer asked the respondent questions to determine if a frequency switch had occurred. These respondents were asked if they had increased the number of days per week that they used any of the current alternative modes. For efficiency in the interview, interviewers asked these respondents about the alternative modes they had said they were currently using.

Twenty-five respondents said they increased the number of days they used alternative modes. The remaining 149 respondents said they did not increase alternative mode frequency. The counts by mode for the 25 who made a frequency change are shown in Table 9.

TABLE 9: FREQUENCY CHANGE RESPONDENTS

Alternative Mode	Respondents with Frequency Change
Carpool	9
Bus	3
Train	4
Walk	4
Telework	5

Source: November 2002 Regional Switcher Survey

The interviewer asked frequency switchers about their previous travel patterns, but with the modes unchanged from the current modes. As with mode switchers, the measurement team used the data in the previous travel grids to calculate previous weekly vehicle trips for frequency switchers.

Occupancy Switch Screening - Finally, interviewers asked respondents who were currently carpooling, but who said they had not made a mode or frequency shift, if they had increased the number of people riding in the carpool. Seven respondents said they made this switch. Interviewers did not ask vanpoolers this question; vanpool ridership can change frequently and riders might not be able to recall such changes accurately. Further, since vanpools already are assigned a small vehicle count (inversely proportional to the number of vanpool riders), the measurement team decided omitting vanpool occupancy changes would result in a very small loss of credit.

CVT and PVT Switcher Tests

The last section of the screening portion of the survey identified respondents who made switches that reduced the number of weekly commute trips. It might appear that the three previous tests for mode switches, frequency switches, or occupancy switches would have accomplished this task, but this was not necessarily the case. For example, some of the mode switchers could have switched from higher occupancy alternative modes to lower occupancy modes, and thus increased their number of weekly vehicle trips, despite having made a mode switch.

Thus, a final test was needed to identify switches accurately. The test compared the Current Weekly Vehicle Trips (CVT) against the Previous Weekly Vehicle Trips (PVT) to see if weekly vehicle trips had been reduced. If the number of trips declined, the respondent was a switcher. Once identified as a switcher, survey interviewers then asked these respondents additional questions about their travel patterns and what influenced their decision to make a commute change.

Respondents who were determined to be non-switchers were thanked for participating in the survey and the interviews were terminated. Because the measurement team needed a pre-determined number of 400 switcher interviews, screening interviews continued until this total was reached. The total number of screening interviews needed to obtain 400 switchers also was an important data item; it represented the incidence of switching that would be applied to the regional employment population to estimate the total number of switchers in the population at large.

TRAVEL AND EMISSION REDUCTIONS

The measurement team developed four methods to examine the travel and emission reductions from commute changes using various assumptions about the nature and timing of the commute changes and the motivations for the changes. As described below, Method 1, 2, and 3 present a regional assessment of commute changes. Method 4 involves a more specific assessment of regional commute changes associated directly with VMEPs. As such, Method 1 through 3 includes both VMEP and “collateral” participation, or commute changes, while Method 4 includes only commute changes participants associate with a VMEP. A brief summary of each method is presented below.

Method 1 – All Regional Commute Changes during 12-Year Evaluation Period

Method 1 credits reductions from commute changes that have occurred in the region anytime since 1990, the SIP baseline year. This method does not consider the motivation for commute changes, and, nor does it consider if VMEPs influenced the changes.

Method 1 also counts only commute changes that reduce weekly vehicle trips, that is, changes from single occupant vehicles to alternative modes and changes from lower occupancy modes to higher occupancy modes (e.g., from carpool to transit). It does not include respondents whose commute changes increased their weekly vehicle trips, such as would occur if a commuter switched from transit to carpooling. Nor does it include commuters who switched from alternative modes to driving alone, which would also result in increased weekly vehicle trips. As such, Method 1 does not reflect the full range of commute changes that occurred during this time period.

The resulting alternative mode placements and travel and emission reductions for Method 1 are shown in Table 10. As shown, the results from this method exceed the VMEP commuter placement, VMT, and emission targets, but they do not meet the vehicle trip target.

TABLE 10: METHOD 1 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES

Impact Measure	12-year	VMEP SIP Targets
Commuter placements	308,550	147,384
Daily vehicle trips reduced	258,318	294,768
Daily VMT reduced	5,088,867	4,421,487
Daily NO _x emissions reduced (tons per day)	6.00	4.28
Daily VOC emissions reduced (tons per day)	6.95	6.51

Source: November 2002 Regional Switcher Survey

Method 2 – Regional Commute Changes during Abbreviated Evaluation Period

Like Method 1, Method 2 does not consider the motivation for commute changes or account for the full range of commute changes. However, Method 2 does consider the time period for when commute changes took place by crediting reductions from commute changes that occurred during the time period when the region implemented VMEPs in earnest. Method 2 examines commute changes occurring over the past five years (Method 2-5Y) and commute changes occurring over the past two years (Method 2-2Y).

The 5-year evaluation period begins at the time when the region initiated many of the current local and regional commute services, such as the regional rideshare database and state and federal employer commute assistance programs. The 2-year evaluation period begins at the time the region initiated a large-scale media campaign and increased employer outreach to promote private sector employer commute assistance programs.

The resulting alternative mode placements and travel and emission reductions for Method 2 are shown in Table 11. As shown, the results for the 5-year evaluation period would meet the commuter placement, VMT, and NO_x targets but not the vehicle trip and VOC targets. Results for the 2-year period would meet the commuter placement target and nearly meet the NO_x target, but would fall substantially short of the vehicle trip, VMT, and VOC targets.

TABLE 11: METHOD 2 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES

Impact Measure	5-year (2-5Y)	2-year (2-2Y)	VMEP SIP Targets
Commuter placements	269,981	205,186	147,384
Daily vehicle trips reduced	227,713	176,341	294,768
Daily VMT reduced	4,510,995	3,539,159	4,421,487
Daily NO _x emissions reduced (tons per day)	5.45	4.25	4.28
Daily VOC emissions reduced (tons per day)	6.32	4.92	6.51

Source: November 2002 Regional Switcher Survey

Method 3 – Higher to Lower Occupancy Adjustment

Method 3 partially addresses the issue of measuring the full range of commute changes by factoring in switches from higher to lower occupancy alternative modes, for example from transit to carpool.

This method provides an indication of at least part of the potential negative impact of commute changes that increase weekly vehicle trips. Method 3 does not account for all negative impacts, because it does not include switches from alternative modes to driving alone. The method examines all three time periods described earlier: 12-year, 5-year, and 2-year.

The resulting alternative mode placements and travel and emission reductions for Method 3 are shown above in Table 12. The commuter placement targets are met for all time periods, but the vehicle trip targets are not. The VMT target is met for the 12-year period only and NO_x targets are met for the 12-year and 5-year periods. None of the results meet the VOC target.

TABLE 12: METHOD 3 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES

Impact Measure	12-year High to Low Occupancy Adjustment (3-12Y)	5-year High to Low Occupancy Adjustment (3-5Y)	2-year High to Low Occupancy Adjustment (3-2Y)	VMEP SIP Targets
Commuter placements	308,550	269,981	205,186	147,384
Daily vehicle trips reduced	227,721	207,402	159,525	294,768
Daily VMT reduced	4,486,099	4,108,628	3,201,663	4,421,487
Daily NO _x emissions reduced (tons per day)	5.29	4.97	3.85	4.28
Daily VOC emissions reduced (tons per day)	6.13	5.75	4.46	6.51

Method 4 – Direct Attribution to VMEPs and Higher to Lower Occupancy Adjustment

Method 4 considers the motivation for commute changes, and specifically VMEPs that might influence commute behavior. Method 4 credits only influences from VMEP messages and services respondents can name or recall. As a result, it does not count the subconscious effect or indirect impact of VMEPs that are not immediately evident or obvious to individuals making commute changes. It is likely that many commuters are prompted to make commute changes, but are not fully aware of the influences (either influences on them or on a rideshare partner) that led to the change. The results from Method 4 fall substantially short of all VMEP targets.

The survey asked switchers what factors influenced their decisions to make commute changes. The factors cited by respondents (unprompted) that could reflect an influence of VMEPs are listed below, along with the percentages of respondents who noted them:

- Received carpool/vanpool/transit subsidy 1.3% of respondents
- Received other commute service from employer 1.5%
- Received commute service from other organization 0.5%
- Saw/heard ad/news story about commute options 0.5%

To attempt to identify all direct influence, survey interviewers directly asked respondents who did not mention one of the first three influences if the switch was influenced by “any information or service provided to you by your employer or by an organization that provides commute information

or services?” About one in eight respondents (12.0%) said the information or service influence their changes and 4.9% said the information or service “somewhat influenced” the change. These percentages, combined with the percentages noted above, suggest that about 20.7% of respondents were influenced by such a service.

More than four in ten respondents (42.4%) said no service or information influenced them and another 40.6% said they did not receive any information or services.

Switchers mentioned two other influence factors that possibly were related to activities undertaken by a local or regional commute services organizations, but these influences could have occurred without any commute program assistance:

- Telework became available 12.3%
- Change in work schedule/Compressed Work Week became available 6.3%

It is important to note that survey interviewers directly asked respondents who mentioned these two influences also if their commute change was influenced by “any information or service provided to you by your employer or by an organization that provides commute information or services?” Thus, these respondents were given the opportunity to define what influenced them to telework, make a work schedule change, or work a compressed work week schedule.

The resulting alternative mode placements and travel and emission reductions are shown in Table 13. The results fall substantially short of the VMEP targets.

TABLE 13: METHOD 4 – DAILY TRAVEL AND EMISSION REDUCTIONS FOR COMMUTE TRAVEL CHANGES

Impact Measure	12-year High to Low Occupancy & Influence Adjustment (4-12Y)	5-year High to Low Occupancy & Influence Adjustment (4-5Y)	2-year High to Low Occupancy & Influence Adjustment (4-2Y)	VMEP Targets
Commuter placements	60,939	50,139	37,026	147,384
Daily vehicle trips reduced	42,027	35,779	28,502	294,768
Daily VMT reduced	907,355	819,693	633,031	4,421,487
Daily NO _x emissions reduced (tons per day)	1.04	0.93	0.71	4.28
Daily VOC emissions reduced (tons per day)	1.21	1.08	0.82	6.51

Source: November 2002 Regional Switcher Survey

SECTION 3 DECEMBER 2002 REGIONAL TRANSPORTATION SURVEY

PURPOSE

Over the past three years, the measurement team has conducted seven regional transportation surveys to assess general trends in metro Atlanta resident awareness, attitudes, and use of alternative forms of transportation for commuting. The measurement team added a series of questions on non-commute behavior to the most recent regional transportation survey (December 2002) to test if a regional survey of this nature could gather data on non-commute behavior changes.

Non-commute travel changes are not part of the current scenario proposed by EPD in Appendix XXV of the SIP. Typically, VMEPs focus on commuter related assistance programs; however, as part of employer and commuter outreach, VMEPs also could promote the use of alternative modes for reducing non-commute trips. EPD wanted to investigate the potential impact these efforts may be having on non-commute travel changes and the impact these changes may have on the overall VMEP target assessment.

The survey findings present a regional assessment of non-commute behavior changes during FY2002 and do not consider the motivation or influences for behavior changes. The measurement team used the survey findings, in combination with other regional data, to prepare an estimate of potential non-commute travel and emission reductions from non-commute travel changes. Like the regional switcher survey, the regional transportation survey focused on changes that reduced the number of weekly non-commute trips made by metro Atlanta residents to follow the EPD scenario for commute related changes in Appendix XXV of the SIP.

A copy of the full December 2002 Regional Transportation Survey Report can be found in Appendix B. The report includes a detailed description of the data collection methodology and survey findings. Appendix C presents a detailed description of the travel and emission reduction calculations for the non-commute behavior assessment. A summary of the report is presented below.

METHODOLOGY

Approximately 1,500 metro Atlanta residents participated in the December 2002 regional transportation telephone survey. The measurement team stratified and weighted the sample to ensure representation of the region and set minimum sampling quotas for geographic territories, closely following the designated service areas for VMEP employer outreach in the 13-county nonattainment area. The margin of error for the survey is +/- 2.5% in 95 out of 100 cases.

The measurement team added the non-commute travel questions to the existing regional travel survey, a general survey of metro Atlanta residents 18 years or older, so that the regional switcher survey could focus on commuters who had made specific changes to their commute travel.

FINDINGS

The regional transportation survey polled metro Atlanta residents on several actions they might have taken to reduce VMT for non-commute travel in the past year (FY2002). Specifically, survey interviewers asked respondents if they had increased their use of alternative forms of transportation for non-commute trips and how many more non-commute trips they were making as a result in an average week. The questions involved three groups of alternative modes—carpooling or vanpooling, bus or train, or bicycling or walking—and two non-mode specific alternatives—combining trips and elimination of trips due to online or phone transactions.

As shown in Table 14, a large number of Atlanta residents eliminated, combined, or increased the number of trips they made using alternative forms of transportation for non-commute trips during FY2002.

TABLE 14: METRO ATLANTA RESIDENTS USE OF ALTERNATIVE FORMS OF TRANSPORTATION FOR NON-COMMUTE TRAVEL

Alternative Form of Transportation	Percent of Metro Atlanta Residents	Trips Reduced Per Week
Eliminated Trips (due to online or phone transactions)	55%	2.9
Combined Trips (Trip Chaining)	83%	NA
Carpooling or vanpooling	14%	3.2
Bus or train	14%	1.8
Bicycling or walking	20%	2.5

Source: December 2002 Regional Transportation Survey

TRAVEL AND EMISSION REDUCTIONS

The travel and emission reductions presented below include only the reductions from increased use of alternative *modes* of transportation—carpooling or vanpooling, bus or train, and bicycling or walking. The measurement team excluded trip chaining and the elimination of non-commute trips from the travel and emission reduction assessment because of the difficulty of attributing these changes to a VMEP. Most people trip chain routinely for efficiency purposes and trips might or might not be reduced through shopping online or conducting business over the phone. For example, one may purchase books online but still make a trip to a shopping mall for clothing where they also ordinarily would have purchased the same books.

In addition, because there was concern among the measurement team that respondents may have overestimated the number of non-commute mode changes made, respondents who said they had reduced their number of weekly non-commute trips by 10 or more trips per week were not included in the travel and emission reduction totals. Lastly, the non-commute trip changes do not account for vehicle drivers who might have switched back and forth between modes over the course of the year, and, as a result, the assessment may still overestimate non-commute travel changes to some degree.

The non-commute mode changes for respondents who reduced the number of weekly non-commute trips by 9 or less trips over the past year are presented in Table 15.

TABLE 15: METRO ATLANTA RESIDENTS INCREASED USE OF ALTERNATIVE MODES FOR NON-COMMUTE TRAVEL

Alternative Mode	Percent of Metro Atlanta Residents Increased Use	Trips Reduced Per Week
Carpooling or vanpooling	10.3%	2.4
Bus or train	9.7%	2.0
Bicycling or walking	14.5%	2.5

Source: December 2002 Regional Transportation Survey

Using these findings and additional data provided by the Atlanta Regional Commission (ARC), the measurement team conducted an interim assessment of travel and emissions reduced by non-commute travel changes. The method estimates the total number of non-commute trips in the region for the three mode groups and applies trip length and other factors to estimate VMT and emissions reduced by these trips. Because trip lengths can vary substantially by mode, the measurement calculated trip and VMT reductions for each of the three mode groups and then aggregated the mode group travel and emission reductions. The estimate is for fiscal year 2002 only.

As shown in Table 16, adding these reductions to the commute travel and emission reduction findings from the regional switcher survey would increase the likelihood of the nonattainment area meeting the VMEP target.

TABLE 16: SUMMARY OF FY2002 DAILY TRAVEL AND EMISSION REDUCTIONS FOR NON-COMMUTE CHANGES

Impact Measures	Non Commute Travel			
	Carpool/ Vanpool	Transit/ Bus	Bike/ Walk	Totals
Percent of population increasing alternative mode use for non-commute travel	206,448	194,422	290,631	691,502
Daily non-commute trips reduced	52,796	41,434	77,422	171,652
Daily non-commute VMT reduced	480,799	256,615	154,457	891,871
NO _x emissions reduced (tons per day)	.71	.38	.23	1.31
VOC emissions reduced (tons per day)	.61	.33	.20	1.13

Source: December 2002 Regional Transportation Survey

It is also important to note that the non-commute analysis focuses on changes over a one year time period. Although it is likely many respondents made changes prior to FY2002, it is unlikely survey respondents will be able to recall these types of changes accurately, especially if asked to recall changes made in a previous year.

SECTION 4 FY2002 ATLANTA TDM FRAMEWORK EVALUATION

PURPOSE

GDOT is leading an effort to coordinate and maximize the effectiveness of transportation demand management (TDM) related Congestion Mitigation and Air Quality Improvement (CMAQ) funded projects and other federal, state, and privately funded projects in the 13-county nonattainment area. A primary component of this effort is an annual evaluation to measure travel and emission reductions for commuters who participate in TDM projects that receive CMAQ funds. The organizations participating in the evaluation are referred to as the Atlanta TDM Framework and are VMEPs.

While the annual evaluation is not conducted for the VMEP target assessment specifically, the measurement team has included it in this report as support data for the regional switcher survey commute travel and emission reduction findings. The measurement team cautions EPD against relying on the Atlanta TDM Framework evaluation for the VMEP target assessment. The Atlanta TDM Framework evaluation includes only the programs that can be validated with established data sources, and thus represents a conservative, lower bound estimate of commute related travel and emission reductions. In addition, the evaluation represents alternative mode use over a shorter time period than the VMEP target evaluation period in the SIP (1990 baseline, 12 year evaluation period).

The full FY2002 Atlanta TDM Framework Evaluation Report can be found in Appendix D. The report includes a detailed description of the FY2002 evaluation data collection methodology, survey findings, and travel and emission reductions. A summary of the report is presented below.

METHODOLOGY

The measurement team based the evaluation on fiscal year 2002 program level data collection activities. The evaluation included travel and emission reductions from a sample of employer partners of The Clean Air Campaign and TMAs, as well as regional rideshare database participants, vanpool riders, and discount transit pass recipients. Brief descriptions of the specific data collection activities are included below.

October 2002 Regional Rideshare Placement Survey

The regional rideshare placement survey involved telephone interviews with 1,000 registrants who entered the database or received assistance from Commute Connections during the FY2002 evaluation period, representing a margin of error of +/- 5.0% at the 95% confidence level. An additional 375 registrants who entered the database prior to FY2002 and did not receive assistance from Commute Connections during FY2002 participated in a companion survey. The margin of error for this survey is +/- 2.9% at the 95% confidence level. The survey findings of the 1,000 registrants estimated the level of registrant placement in alternative modes, while the findings from the companion survey provided data on rideshare longevity.

October 2002 Employer Partner Employee Travel Survey

Conducted as a pilot in FY2002, the self-administered employer partner employee travel survey surveyed employees at a sample of employers working with The Clean Air Campaign and TMAs to implement commute assistance programs. The measurement team used the survey findings: 1) to calculate the commute related travel and air quality emission reductions achieved by employees using alternative modes and 2) to begin to develop a model, built on the travel choices of surveyed employees, which predicts the travel choices of non-surveyed employees in similar situations, with the goal of providing a regional estimate of commute related travel and emission reductions for VMEP employer partners.

Conducted as a pilot in FY2002, the survey findings only represented about 10% of the employees working for Clean Air Campaign or TMA employer partners. The Atlanta TDM Framework will add additional employers to the survey pool in subsequent years to increase the number of employees represented by the survey findings and provide a more accurate estimate of the level of travel and emission reductions achieved by Clean Air Campaign and TMA employer partners.

November 2002 Vanpool Rider Survey

Vanpool drivers and riders from the three primary Atlanta vanpool vendors—Douglas County Rideshare, Georgia Building Authority, and MetroVanPool—participated in the self-administered vanpool rider survey. A total of 190 vanpools—representing 1,864 vanpool riders—received the survey in mid November 2002. A total of 818 vanpool riders returned a completed survey, for a response rate of about 44%. The margin of error for the survey is +/- 2.6% at the 95% confidence level.

February 2003 Discount Transit Pass User Survey

An estimated 29,698 transit riders received discount transit passes during FY2002. A stratified sample of discount monthly transit pass recipients participated in the self-administered survey distributed with transit passes for the month of February 2003. The final sample included a survey distribution of 13,881 surveys through 87 employers. A total 3,440 transit pass recipients returned completed surveys, a response rate of about 24%. The margin of error for the survey is +/- 1.6% at the 95% confidence level.

TRAVEL AND EMISSION REDUCTIONS

Using these program level data collection activities, the measurement team identified the number of commuters using commute alternatives associated with the Atlanta TDM Framework during FY2002. The resulting travel and emission reductions are presented in Table 17. The travel and emission reductions include commuters who began using alternative modes or increased their frequency of alternative mode use during FY2002 and commuters who began using alternative modes prior to the FY2002 and maintained use of those alternative modes during the year.

TABLE 17: FY2002 ATLANTA TDM FRAMEWORK EVALUATION –TRAVEL AND EMISSION REDUCTIONS (COMMUTE RELATED)

Impact Measure	Atlanta TDM Framework
Commuter placements	53,442
Daily vehicle trips reduced	37,507
Daily VMT reduced	779,924
Daily NO _x emissions reduced (tons per day)	0.77
Daily VOC emissions reduced (tons per day)	0.89

Source: FY2002 Atlanta TDM Framework Evaluation

As shown in Table 17, the VMT, NO_x, and VOC reductions for the annual Atlanta TDM Framework evaluation fall between Method 4-5Y and Method 4-2Y projections for the regional switcher survey. As mentioned previously, both the Atlanta TDM Framework evaluation and the Method 4 regional switcher survey evaluation represent conservative, lower bound estimates of travel and emission

reductions associated with VMEPs. The fact that the travel and emission reductions for these two methods are similar validates these conservative approaches.

SECTION 5 RECOMMENDATIONS AND CONCLUSIONS

The interim VMEP target assessment identifies a difference between measured data and the TDM attainment scenario described in Appendix XXV of the SIP. The number of commuter placements identified in the regional switcher survey revealed that EPD underestimated the overall number of commuter related placements and overestimated the number of daily vehicle trips reduced as a result of these commuter placements. In other words, more commuters are being placed in alternative modes but the actual number of vehicle trips each commuter is reducing is less than the EPD estimate.

The TDM scenario proposed by EPD also overestimates the number of VMEP associated commuter placements. A comparison of the commuter placement estimates for Method 3 and Method 4 reveal that VMEP related commuter placements currently make up about 20% of regional placements, with “collateral” participation making up the remaining 80% of regional placements. The EPD scenario estimated approximately 90% of the commuter placements would come from VMEPs. It is likely a higher percentage of commuter placements are associated with VMEPs than identified in the regional switcher survey, but, due to the difficulty in identifying why people make commute changes, VMEP related participation or commuter placements cannot be measured accurately. The potential undercounting of VMEP related placements is supported by the over 600 employer partners, totaling to more than 600,000 employees, currently affiliated with The Clean Air Campaign or TMAs. This estimate greatly exceeds the EPD SIP estimate of 479 employer partners, totaling to 338,000 employees by the 2004 attainment date.

As stated previously, many commuters are prompted to make commute changes, but are not fully aware of VMEP influences on them or on their rideshare partners. Therefore, any attempts to determine the VMEP and collateral participation influence will always show a higher percentage of collateral participation, some of which has been influenced indirectly by VMEPs. These findings support the focus that EPD has on the total emission reductions to be achieved and not on the distinction between VMEP and collateral participation or commute changes, since it may be impossible to accurately determine the influences VMEP related messages and services have on commuters.

In addition, the current scenario does not include potential impacts from non-commute travel changes. The non-commute assessment indicates metro Atlanta residents made significant changes in non-commute travel during FY2002, with reductions close to 20% of the current travel and emission targets. As such, EPD should also consider adding travel and emission reductions for non-commute behavior changes to the TDM emission reduction target.

These findings suggest several recommendations EPD should consider when refining the methods and data collection tools for future VMEP target assessments. The recommendations, if implemented, will allow EPD to assess both VMEP and collateral participation, or both regional commute changes and commute changes directly associated with VMEPs. The recommendations include:

- **Collect data on “drive alone switchers”.** A regional assessment of commute behavior change should include all commute changes, not just those that result in a reduction in travel and emissions for the region. The recommendation involves expanding the regional switcher survey to capture all types of commute changes, including commuters who switch from an alternative mode to drive alone. EPD could then include the full range of commute change impacts in the overall regional behavior change assessment.

When evaluating commute changes associated directly with VMEPs, the measurement team believes it is appropriate to exclude “drive alone switchers”. VMEPs do not encourage

commuters to switch back to drive alone; personal circumstances, such as changing jobs, are more likely the reasons for these changes.

- **Refine commute methodology questions related to VMEP influence.** The recommendation involves refining the regional switcher survey to include more detailed questions about why commuters made commute changes and the potential influence of VMEPs on the commute changes in order to examine causality more thoroughly. Examining influence more thoroughly may help address, to some degree, the possible undercounting of commute changes influenced by VMEPs. However, VMEP related commuter placements measured via a regional transportation survey are likely to represent a conservative lower bound estimate of VMEP related travel and emission reductions, due to the difficulty in identifying why people make commute changes.
- **Refine the non-commute methodology to ask more detailed questions about non-commute travel changes and questions about influence of VMEPs.** The 2002 non-commute assessment is based on general questions asked of metro Atlanta residents 18 years or older (December 2002 regional transportation survey) and regional data provided by the Atlanta Regional Commission. This recommendation involves adding a question to the regional transportation survey about the number of weekly non-commute trips, on average, made by each respondent. This question addresses the concern among the measurement team that respondents may have overestimated the number of weekly trips reduced by non-commute mode changes that they reported in the December 2002 survey and help frame the number of non-commute trips, on average, actually made by respondents. Adding an additional question on the longevity of the commute change will help address the measurement team concern about residents switching back and forth between modes during the year.

In addition, the measurement team recommends adding questions to the non-commute series of questions about the potential VMEP influence for an evaluation of non-commute changes directly associated with VMEPs.

- **Continue to enhance annual Atlanta TDM Framework Evaluation, using it to support the findings of the commute behavior change assessment.** The measurement team recommends that the Atlanta TDM Framework continue to conduct and enhance annual evaluations of their programs so that EPD can use these findings to support the overall VMEP target assessment. In particular, the Atlanta TDM Framework should continue to increase the number of employer partners participating in employee level travel surveys in order to provide a more accurate estimate of the level of travel and emission reductions achieved by Clean Air Campaign and TMA employer partners.